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REMARKS

Claims 1-20 are all the claims presently pending in the application. Claims 1-12 stand rejected on prior art grounds and for informalities. New claims 13-20 have been added to claim additional features of the invention. This Amendment amends claims 1-12. Attached hereto is a marked-up version of the changes made to the claims by the current Amendment.

It is noted that the claim amendments are made to merely clarify the language of each claim, and not for distinguishing the invention over the prior art, narrowing the claims, or for any statutory requirements of patentability. It is further noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 1-12 stand rejected under 35 U.S.C. § 112, second paragraph.

Regarding the prior art rejections, claims 1-2, 5-8, and 11-12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng (U.S. 6,259,708) in view of Phillips (U.S. 6,243,377). Claims 3-4 and 9-10 are rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng and Phillips, in further view of Kaplan (U.S. 6,141,339).

The rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

Applicant's invention, as disclosed and defined in claim 1, is directed to an asymmetrical digital subscriber line (ADSL) system for transferring an analog audio signal of analog communication equipment and high speed digital data of high speed digital data equipment provided on the side of a subscriber, from and to a station, through one subscriber line that includes an apparatus on the subscriber side in which an analog audio signal of the

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analog communication equipment is converted into a digital audio signal, the subscriber side apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data by time division, and supplied to the subscriber line after being modulated by a first ADSL modem, while after a signal received from the station through the subscriber line is demodulated by the first ADSL modem, the digital audio signal is converted into an analog audio signal and supplied to the analog communication equipment, and at the same time high-speed digital data is supplied to a high-speed digital data equipment.

The invention also includes an apparatus on the station side in which a signal received from the apparatus on the subscriber side through the subscriber line is demodulated by a second ADSL modem, thereafter the digital audio signal is converted into an analog audio signal, which is supplied to an analog telephone network, and at the same time high-speed digital data is supplied to a high-speed digital data network, while an analog audio signal of the analog telephone network is converted into a digital audio signal, the station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem.

An important feature of the invention is that the apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into asynchronous transfer mode (ATM) cells in each respective line concentrator and attach each destination address to the ATM cells.

As a result, the present invention provides a more efficient system for transferring an analog audio signal and a high-speed digital data signal together through the same ADSL subscriber line without using a plain old telephone system (POTS) splitter on the station side.

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In complete contrast, a conventional ADSL system must contain a POTS (plain old telephone system) splitter, which is an integrated separator (e.g., a filter) for separating an analog audio signal and high-speed digital data, on both sides of a station and subscriber.

The claimed invention, however, uses analog-to-digital/digital-to-analog (AD/DA) convertors to convert the analog signal to digital and multiplex the digital audio and data together on a single line using a time division method. The multiplexed signal is then converted to ATM cells for transport between the subscriber and the station.

II. THE PRIOR ART REJECTIONS

THE CHENG AND PHILLIPS REFERENCES

The Examiner alleges that claims 1-2, 5-8, and 11-12 stand rejected under 35 U.S.C. §103(a) as unpatentable over Cheng (U.S. 6,259,708) in view of Phillips (U.S. 6,243,377). Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by the Examiner's urged combination of references.

Cheng discloses a system for digitizing voiceband signals at the remote terminal that are embedded in a DSL data stream (col. 4, lines 45-46). The DSL signal stream and the digitized voiceband signals embedded in the DSL stream are received by a DSL modem (col. 4, lines 50-55). A receiving DSL device converts the voiceband signals into analog equivalent signals which are output on an analog terminal (col. 5, lines 55-59).

The Examiner admits that Cheng does not teach that the voice signal and DSL data stream are concentrated on lines in a way of time division. As a result, the Examiner alleges that Phillips contains such a feature (Office Action, p. 4), and that the combination of Cheng and Phillips teaches the claimed invention.

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However, Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different objectives and matters than those of the present invention.

Specifically, Cheng discloses a device configured to receive digitized voiceband signals and intersperse them into an upstream DSL signal stream to a central office facility (col. 2, lines 49-54). On the other hand, Phillips discloses a system where "data signals pass through a packet switched network and avoid the telephone network," (col. 2, lines 25-51).

Given these disparate objects, problems allegedly solved, and the unusual solutions offered, the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged. The Examiner alleges that Phillips' background reference to the ISDN (Integrated Services Digital Network) motivates the use of a single telephone line to be used for simultaneous data and/or voice related calls (col.1, lines 29-44). However, Phillips discloses that the Examiner's basis for the alleged motivation to combine is improper: "ISDN requires an entirely new network solution, and for Internet access generally makes the same relatively inefficient use of PSTN resources as the traditional modem connection," (col. 1, lines 40-44).

The prior art references themselves must suggest the desirability, and thus the obviousness, of making the combination, independent of the present invention and a thorough reading of Applicant's own specification. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. In this case, the prior art reference (Phillips) criticizes the use of ISDN to carry simultaneous voice and/or data and therefore cannot motivate the combination of references as alleged by the Examiner.

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A device of the present invention to receive digitized voiceband signals and intersperse them into an upstream DSL signal stream is a completely different aim than a network sending data signals on a packet switched network to avoid the telephone network. As described in the prior art the Examiner has admitted that a voice signal and DSL data stream that are concentrated by time division are not found in Cheng.

However, Phillips fails to make up for Cheng's deficiencies. Phillips discloses "[r]emote terminal equipment . . . provided for installation at the subscriber premises while corresponding central terminal equipment is installed at the service provider or exchange premises," (col. 2, lines 25-51). The Examiner has not found the elements in Phillips that teach or suggest all the claimed elements of the present Application. Certainly, no person of ordinary skill in the art would consider combining such divergent references, absent hindsight.

Thus, Applicant respectfully submits that these references would not have been combined as alleged by the Examiner. Additionally, even if combined, the combination would not teach or suggest the claimed invention.

The Examiner alleges that column 1, lines 29-44 and Figure 4 of Phillips teach a system where voice and digital data are concentrated on lines in a way of time division. However, the passage of Phillips merely discloses a system where "data signals pass through a packet switched network and avoid the telephone network" and "remote terminal equipment is provided for installation at the subscriber premises while corresponding central terminal equipment is installed at the service provider or exchange premises," (col. 2, lines 25-51).

Phillips discloses a system with "connections at an exchange" where "voice signals pass through the circuit switched public telephone network in the usual way," (col. 2, lines

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24-26) and where “remote terminal equipment is provided for installation at the subscriber premises while corresponding central terminal equipment is installed at the service provider or exchange premises,” (col. 2, lines 27-30).

Contrary to the Examiner’s assertions, the citation from Phillips does not teach or suggest concentrating (e.g. multiplexing) digital audio and data signals by time division in an ADSL system. Further, Figure 4 from Phillips is a flowchart showing equipment modules having a connection 100 labeled “DSL.” However, Figure 4 is merely a basic flowchart showing various network equipment hardware with connections and has no specific disclosure of all the elements of the claimed invention.

Therefore, the Examiner is incorrect in alleging that column 2, lines 25-51 of Phillips teaches or suggests the claimed invention of “an apparatus on the subscriber side in which an analog audio signal . . . is converted into a digital audio signal, the digital audio signal together with the high-speed digital data is concentrated by time division, and supplied to the subscriber line after being modulated by a first ADSL modem,” as recited in claims 1 and 7. (emphasis Applicant’s).

Phillips’s also discloses sending digital voice signals to the public telephone network and data signals to a packet switched network (col. 1, lines 25-28). The claimed invention, on the other hand, includes an apparatus on the subscriber side and an apparatus on the station side wherein an analog audio signal of the analog telephone network is converted into a digital audio signal and the digital audio signal and high speed data together are concentrated by time division prior to modulation/demodulation (e.g. a first ADSL modem on the subscriber side and a second ADSL modem on the station side), as recited in claim 1. These claim elements are not found in the Examiner’s citation to Phillips.

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Therefore, neither Cheng nor Phillips teaches, or for that matter renders obvious, the claimed invention of “*an apparatus on the subscriber side in which an analog audio signal of the analog communication equipment is converted into a digital audio signal, said subscriber side apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data by time division, . . . and*

an apparatus on the station side . . . said station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem . . .” as recited in claim 1 (emphasis Applicant’s).

Further, there is no teaching or suggestion of an ADSL system having an apparatus on the subscriber side that comprises “. . . a line concentrator for concentrating the digital audio signal and the high-speed digital data by time division; and a first ADSL modem for modulating the digital audio signal and the high-speed digital data and supplying the modulated signal to the subscriber line, and demodulating a modulated signal received from the station side through the subscriber line,” and an apparatus on the station side that comprises “. . . a line concentrator for supplying the digital audio signal modulated by said second ADSL modem to an analog telephone network as well as supplying the high-speed digital data to the high-speed digital data network, and concentrating the digital audio signal from the analog telephone network and the high-speed digital data from the high-speed digital data network by time division, then to send the digital audio signal together with the high-speed digital data to said first ADSL modem,” as recited in claim 7.

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THE KAPLAN REFERENCE

Regarding the rejection of claims 3-4 and 9-10 as unpatentable over Cheng and Phillips, in further view of Kaplan (U.S. 6,141,339), Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by Kaplan.

Kaplan discloses a communications system that is operational to provide a voice over ATM (Asynchronous Transfer Mode) connection between residential hubs in response to a service request directed to one of the service nodes on a broadband wide area network (col. 2, lines 25-37). Figure 1 of Kaplan depicts residences connected to MUXes 120 over ATM connections, and in preferred embodiments, the connections are to ADSL/ATM connections (col. 3, lines 10-20).

The Examiner admits that Cheng and Phillips do not expressly disclose that the claimed apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as high-speed data into ATM cells and attach each destination address to the ATM cells. As a result, the Examiner alleges that Kaplan contains such features, and the combination of Cheng and Phillips in view of Kaplan teaches the claimed invention.

However, Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, these references are directed to different objectives and matters than those of the present invention.

Specifically, Kaplan discloses converting POTS (plain old telephone service) traffic to ATM traffic at the residence, and preferably carries this ATM traffic over an ADSL connection to a multiplexer. Kaplan also discloses converting non-voice traffic to ATM traffic, and preferably carries it over a DSL connection to the multiplexer (col. 3, lines 40-48). Phillips, on the other hand, teaches a “packet switched network” such that an incoming or

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outgoing signals for a subscriber pass through a packet network rather than the PSTN (col. 2, lines 5-10). Kaplan teaches away from using a DSL system based on a packet network in combination with converting voice traffic to ATM prior to sending over a DSL because “standard class 5 switches on the network side of the local loop do not typically handle ATM voice traffic . . . as a result POTS traffic carried by a DSL local loop still requires processing by a complex and expensive class 5 switch,” (col. 1, lines 45-51).

Given these disparate objects, problems allegedly solved, and the unusual solutions offered, the Examiner can point to no motivation or suggestion in the references to urge the combination of Kaplan with Cheng and Phillips as alleged. The prior art references themselves must suggest the desirability, and thus the obviousness, of making the combination, independent of the present invention and a thorough reading of Applicant's own specification. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In this case, the prior art reference (Kaplan) criticizes the use of packet networks to carry simultaneous voice and/or data over DSL and therefore cannot motivate the alleged combination of references to teach the present invention. Certainly, no person of ordinary skill in the art would consider combining such divergent references, absent hindsight.

Applicant respectfully submits that these references would not have been combined as alleged by the Examiner, and even if combined, the combination would not teach or suggest the claimed invention.

In fact, Kaplan does not teach or suggest the claimed “apparatus on the subscriber side and apparatus on the station side [that] convert each digital audio signal as well as

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high-speed digital data into ATM cells in the line concentrator, and attach each destination address to the ATM cells” as recited in independent claims 1 and 7. For example, in an exemplary embodiment “the respective ATM cell strings 43 and 44 with the individual destination addresses (VPI/VCI) attached thereto are supplied to the line concentrating unit 18 for time division and converted into an ATM cell string 45, which is supplied to the ADSL modem 15,” (page 5, lines 8-15).

The claimed invention, taken as a whole, relates to a different technology with a different structure and purpose than that of the cited references. Even assuming arguendo that Kaplan’s system teaches simultaneous voice and data transmission over ADSL, any similarities between Kaplan with the claimed invention ends there. Kaplan has no teaching or suggestion of either supplying ATM addresses within a line concentrating unit. Accordingly, Kaplan does not teach or suggest the novel features of “*said apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as high-speed digital data into ATM cells in the line concentrator and attach each destination address to the ATM cells.*”

Further, Kaplan fails to disclose a line concentrator to concentrate the digital audio signal together to send over an ADSL line. Thus, turning to the exemplary language of claim 1, there is no teaching or suggestion in the cited references of “*an ADSL system for transferring an analog audio signal of analog communication equipment and high speed digital data of high speed digital data equipment provided on the side of a subscriber, from and to a station, through one subscriber line, comprising:*

an apparatus on the subscriber side in which an analog audio signal of the analog communication equipment is converted into a digital audio signal, said subscriber side

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apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data by time division, and supplied to the subscriber line after being modulated by a first ADSL modem, . . . and

an apparatus on the station side in which a signal received from said apparatus on the subscriber side through the subscriber line is demodulated by a second ADSL modem, thereafter the digital audio signal is converted into an analog audio signal, which is supplied to an analog telephone network, and at the same time high-speed digital data is supplied to a high-speed digital data network, while an analog audio signal of the analog telephone network is converted into a digital audio signal, said station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of the high-speed digital data network by time division, and supplied to the subscriber line after being modulated by the second ADSL modem, wherein

said apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into ATM cells in each respective line concentrator and attach each destination address to the ATM cells," (emphasis Applicant's).

Additionally, turning to the exemplary language of claim 7, there is no teaching or suggestion in the cited references of "*an apparatus on the subscriber side in which an analog audio signal of the analog communication equipment is converted into a digital audio signal, said subscriber side apparatus comprising a line concentrator to concentrate the digital audio signal together with the high-speed digital data in a way of time division, . . . and*

an apparatus on the station side . . . said station side apparatus comprising a line concentrator to concentrate the digital audio signal together with high-speed digital data of

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the high-speed digital data network in a way of time division, and supplied to the subscriber line after being modulated by the second ADSL modem, wherein said apparatus on the subscriber side and said apparatus on the station side convert each digital audio signal and the high-speed digital data into ATM cells in each respective line concentrator and attach each destination address to the ATM cells," (emphasis Applicant's).

For at least the reasons stated above, Applicant respectfully submits that the cited references fail to teach or suggest every feature of independent claims 1 and 7.

Furthermore, Applicant submits that claims 2-6 and 8-12 are patentable not only by virtue of dependency from independent claims 1 and 7, respectively, but also by the additional limitations they recite. Therefore, the subject matters of claims 1-12 are fully patentable over the cited references.

Based on the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

III. INFORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to withdraw the rejection and pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner may contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

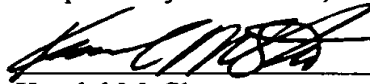
The Commissioner is hereby authorized to charge any deficiency in fees or to credit

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any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Date: 4/15/03

Respectfully Submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims were amended as follows:

1. (Amended) An [ADSL] asymmetrical digital subscriber line (ADSL) system for transferring an analog audio signal of an analog communication equipment and high speed digital data of a high speed digital data equipment provided on the side of a subscriber, from and to a station, through one subscriber line, comprising:

an apparatus on the subscriber side in which an analog audio signal of the analog communication equipment is converted into a digital audio signal,

said subscriber side apparatus comprising a line concentrator to concentrate the [data] digital audio signal together with the high-speed digital data [is concentrated on lines in a way of] by time division, and supplied to the subscriber line after being modulated by [an] a first ADSL modem, while after a signal received from the station through the subscriber line is demodulated by [an] the first ADSL modem, the digital audio signal is converted [in] into an analog audio signal and supplied to the analog communication equipment, and at the same time high-speed digital data is supplied to the high-speed digital data equipment; and

an apparatus on the station side in which a signal received from said apparatus on the subscriber side through the subscriber line is demodulated by [the] a second ADSL modem, thereafter the digital audio signal is converted into an analog audio signal, which is supplied to an analog telephone network, and at the same time high-speed digital data is supplied to a high-speed digital data network, while an analog audio signal of the analog telephone

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network is converted into a digital audio signal,

said station side apparatus comprising a line concentrator to concentrate the [data] digital audio signal together with high-speed digital data of the high-speed digital data network [is concentrated on lines in a way of] by time division, and supplied to the subscriber line after being modulated by the second ADSL modem.

wherein said apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into asynchronous transfer mode (ATM) cells in each respective line concentrator and attach each destination address to the ATM cells.

2. (Amended) An ADSL system as set forth in Claim 1, wherein said apparatus on the subscriber side converts each analog audio signal of a plurality of analog communication equipment into each digital audio signal and concentrates the [data] digital audio signal together with the high-speed digital data [on lines in a way of] by time division.
3. (Amended) An ADSL system as set forth in Claim 1, wherein said apparatus on the subscriber side and said apparatus on the station side convert each digital audio signal as well as each high-speed digital data into ATM cells in the line concentrator, attach each destination address to the ATM cells, and concentrate [concentrates] the [data] digital audio signal together with the high-speed digital data [on lines].
4. (Amended) An ADSL system as set forth in Claim 1, wherein said apparatus on the subscriber side converts each analog audio signal of a plurality of analog communication

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equipment into each digital audio signal and concentrates the [data] digital audio signal together with high-speed digital data [on lines in a way of] by time division, and

said apparatus on the subscriber side and apparatus on the station side convert each digital audio signal as well as each high-speed digital data into ATM cells, attach each destination address to the ATM cells in the line concentrator, and concentrate [concentrates] the [data] digital audio signal together with the high-speed digital data [on lines].

5. (Amended) An ADSL system as set forth in Claim 1, wherein said apparatus on the subscriber side and apparatus on the station side divide each digital audio signal as well as high-speed digital data into fixed time slots and the [data] digital audio signal together with the high-speed digital data is supplied to the subscriber line after being modulated by the first ADSL modem.

6. (Amended) An ADSL system as set forth in Claim 1, wherein said apparatus on the subscriber side converts each analog audio signal of a plurality of analog communication equipment into each digital audio signal and concentrates the [data] digital audio signal together with high-speed digital data [on lines in a way of] by time division, and said apparatus on the subscriber side and apparatus on the station side divide each digital audio signal as well as high-speed digital data into fixed time slots and the [data] digital audio signal together with the high-speed digital data is supplied to the subscriber line after being modulated by the ADSL modem.

7. (Amended) An asymmetrical digital subscriber line (ADSL) system for transferring an

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analog audio signal of an analog communication equipment and high speed digital data of a high speed digital data equipment provided in an apparatus on a subscriber side, from and to an apparatus on a station side, through one subscriber line,[in which] comprising:

said apparatus on the subscriber side comprises

an [AD/DA] analog-to-digital/digital-to-analog (AD/DA) converter for converting an analog audio signal of the analog communication equipment into a digital audio signal or converting a digital audio signal into an analog audio signal, [hence] to supply the same to the analog communication equipment, and supplying the high-speed digital data to the high-speed digital data equipment[.];

a line concentrator for concentrating the digital audio signal and the high-speed digital data [on lines in a way of] by time division[.]; and

[an] a first ADSL modem for modulating the digital audio signal and the high-speed digital data and supplying the modulated signal to the subscriber line, and demodulating a modulated signal received from the station side through the subscriber line[.]; and

[while] said apparatus on the station side comprises [an] a second ADSL modem for demodulating the modulated signal received from said apparatus on the subscriber side through the subscriber line and modulating a digital audio signal and high-speed digital data to be supplied to the subscriber line[.]; and

a line concentrator for supplying the digital audio signal modulated by said second ADSL modem to [the] an analog telephone network as well as

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supplying the high-speed digital data to the high-speed digital data network, and concentrating the digital audio signal from the analog telephone network and the high-speed digital data from the high-speed digital data network [on lines in a way of] by time division, then to send the [data] digital audio signal together with the high-speed digital data to said first ADSL modem,

wherein said apparatus on the subscriber side and said apparatus on the station side convert each digital audio signal and the high-speed digital data into asynchronous transfer mode (ATM) cells in each respective line concentrator and attach destination address to the ATM cells.

8. (Amended) An ADSL system as set forth in Claim 7, wherein said apparatus on the subscriber side comprises a plurality of ones of the [above-mentioned] AD/DA converter[s] corresponding to a plurality of analog communication equipment[,]; and

said line concentrator in said apparatus on the subscriber side concentrates [on lines] each digital audio signal converted by the plurality of AD/DA converters, together with the high-speed digital data, [in a way of] by time division.

9. (Amended) An ADSL system as set forth in Claim 7, wherein said line concentrators in said apparatus on the subscriber side and in said apparatus on the station side convert digital audio signals and high-speed digital data into ATM cells in the line concentrators, attach each destination address to the ATM cells and concentrate [data] the digital audio signal together with the high-speed digital data [on lines].

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10. (Amended) An ADSL system as set forth in Claim 7, wherein said apparatus on the subscriber side comprises a plurality of ones of the [above-mentioned] AD/DA converter[s] corresponding to a plurality of analog communication equipment, and said line concentrators in said apparatus on the subscriber side and in said apparatus on the station side convert digital audio signals and high-speed digital data into ATM cells, attach each destination address to the ATM cells in the line concentrator, and concentrate the [data] digital audio signal together with the high-speed digital data [on lines] .

11. (Amended) An ADSL system as set forth in Claim 7, wherein said line concentrators in said apparatus on the subscriber side and in said apparatus on the station side divide each digital audio signal and high-speed digital data into fixed time slots, and the [data] digital audio signal together with the high-speed digital data is supplied to the subscriber line after being modulated by said ADSL modem.

12. (Amended) An ADSL system as set forth in Claim 7, wherein said apparatus on the subscriber side comprises a plurality of ones of the [above-mentioned] AD/DA converters corresponding to a plurality of analog communication equipment, and said line concentrators in said apparatus on the subscriber side and in said apparatus on the station side divide each digital audio signal and high-speed digital data into fixed time slots, the [data] digital audio signal together with the high-speed digital data is supplied to the subscriber line after being modulated by said ADSL modem.

IN THE ABSTRACT:

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[The ADSL system has an apparatus on the subscriber side converts an analog audio signal of the analog communication equipment into a digital audio signal, concentrates on lines the data together with the high-speed digital data in a way of time division, supplies the data to the subscriber line after modulating the data by an ADSL modem, demodulates a signal received from the station by the ADSL modem, thereafter converts the digital audio signal into an analog audio signal, supplies the same to the analog communication equipment, and at the same time supplies high-speed digital data to a high-speed digital data equipment, and an apparatus on the station side demodulates a signal received from said apparatus on the subscriber side through the subscriber line by the ADSL modem, thereafter converts a digital audio signal into an analog audio signal, supplies the same to an analog telephone network, at the same time supplies high-speed digital data to a high-speed digital data network, converts an analog audio signal of the analog telephone network into a digital audio signal, concentrates on lines the data together with high-speed digital data of the high-speed digital data network in a way of time division, and supplies the data to the subscriber line after modulating the data by the ADSL modem].

An asymmetrical digital subscriber line (ADSL) system for transferring an analog audio signal and high speed digital data on the side of a subscriber, from and to a station, through one ADSL subscriber line, includes an apparatus on the subscriber side which converts an analog audio signal into a digital audio signal. The apparatus includes a line concentrator to concentrate the audio signal together with high-speed digital data by time division, and supplied to the subscriber line after modulation. An apparatus on the station side simultaneously supplies a signal received from the subscriber side to an analog telephone network, and supplies high-speed digital data to a high-speed digital data network. Each

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digital audio signal as well as each high-speed digital data is converted into asynchronous transfer mode (ATM) cells in each respective line concentrator, and each destination address is attached to the ATM cells.